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ABSTRACT OF THE INVENTION

The present invention provides a method for keeping a file system in a
consistent state and for creating read-only copies of a file system. Changes to

5 the file system are tightly controlled. The file system progresses from one
self-consistent state to another self-consistent state. The set of self-consistent
blocks on disk that is rooted by the root inode is referred to as a consistency
point. To implement consistency points, new data is written to unallocated
blocks on disk. A new consistency point occurs when the fsinfo block is

10 updated by writing a new root inode for the inode file into it. Thus, as long as
the root inode is not updated, the state of the file system represented on disk
does not change. The present invention also creates snapshots that are
read-only copies of the file system. A snapshot uses no disk space when it is
initially created. It is designed so that many different snapshots can be created

15 for the same file system. Unlike prior art file systems that create a clone by
duplicating the entire inode file and all of the indirect blocks, the present
invention duplicates only the inode that describes the inode file. A multi-bit
free-block map file is used to prevent data from being overwritten on disk.